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been made, reviews the facts of Mendelism, using plant subjects as illustrations, and introduces some of the more complicated cases. In his second chapter, which considers "The Application of Biological Principles to Plant Breeding," East treats the subject in much the way he did in his earlier valuable bulletin.<sup>3</sup> Perhaps most interesting in the chapter is his discussion and presentation of the evidence for the stimulating effect of crossing.

By far the longest chapter is the sixth (more than a third of the whole book), by Professor Tower, on "Recent Advances and the Present State of Knowledge Concerning the Modification of the Germinal Constitution of Organisms by Experimental Processes." One feels that for general, and professedly non-technical, purposes this chapter would have been improved by the omission of much of the detail of the author's own experiments and a clear statement of the results. Certainly in its present form it does not hold the interest of the reader to an equal degree with the other chapters, and it is difficult to see how a non-biological audience can have followed the detail in the lectures. Tower sums up the evidence to prove that the "impinging of incident forces" upon the germ plasm may modify the germinal constitution of organisms, but combats "the hypothesis of the peripheral origin and transmission of variations," otherwise spoken of in common parlance as "the inheritance of acquired characters." Tower apparently does not, however, consider the fact of possible direct modification of the germinal constitution inimical to Mendelian interpretation.

Chapters VIII. and IX., by Dr. Davenport, contain much of the interesting material given in his recent book on eugenics.<sup>4</sup> The former, entitled "The Inheritance of Physical and Mental Traits of Man and their Application to Eugenics," is largely a catalogue of

<sup>3</sup> "The Relation of Certain Biological Principles to Plant Breeding." By Edward M. East, Ph.D. Conn. Agr. Expt. Sta., Bull. 158, 1907.

<sup>4</sup> "Heredity in Relation to Eugenics." By Charles Benedict Davenport. Henry Holt & Company, New York, 1911.

the method of inheritance of various traits in man, accompanied by family charts by way of illustration. In the second of his chapters are discussed, with concrete examples, the effects of segregation and migration and their eugenic significance, followed by the inevitable "Edwardses" and "Jukes" as examples of the descent of good and bad single lines of germ plasm.

There is little need to call attention to minor inaccuracies in a book of this nature, which really are few. The typography and proof-reading are good. On pages 124 and 125 there was noticed some confusion in referring to figures 53 and 54.

LEON J. COLE

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*A Handbook of Sugar Analysis.* A Practical and Descriptive Treatise for Use in Research, Technical and Control Laboratories. By C. A. BROWNE, Ph.D., chemist in charge of the New York Sugar Trade Laboratory. New York, John Wiley and Sons. 1912. Cloth, \$6.00 net. Sugar tables separate, cloth, \$1.25.

Dr. Browne's volume is the latest and certainly one of the most noteworthy publications by which the literature of the sugar-industry has been enriched within the past decade.

The author presents not only a very full selection of the most approved methods of sugar analysis, but offers—as he is most eminently qualified to do—account of the applicability and limitations of the various methods discussed.

On this account the work is of value not only to the chemist who is entrusted with the supervision and control of the laboratory of a working plant, and who, above all things, seeks to place his finger on the most accurate and practical methods of analysis, but also to the student and worker who desires to understand thoroughly the principles and theory underlying such methods.

The volume is divided into two parts. The first part is given over to a consideration of physical and chemical methods of sugar analy-

sis; the second part, to the occurrence, preparation, properties and reactions of the sugars and their allied derivatives.

Part I., which covers about 500 pages, discusses the sampling of sugars and sugar products; determination of moisture; densimetric analysis; the refractometer and its applications; theory and practical application of polariscopes; the specific rotation of sugars; methods of simple and invert polarization; qualitative methods for the identification of sugars, and methods for the analysis of sugar mixtures.

Part II., in some 260 pages, deals with the formation of sugars in nature, and their classification; the mono-, di-, tri- and tetrasaccharides, the amino-sugars, cycloses and the sugar alcohols and sugar acids.

The sugar-tables, which, for convenience, are grouped together in an appendix of 100 pages, are paged independently of the rest of the volume. They may therefore be bound separately for laboratory use.

An idea of the painstaking care with which this work has been prepared may be gained from the fact that the index alone fills 69 pages. The style in which the book is written is admirably clear and concise; the merits and demerits of the various methods given are objectively and dispassionately stated; the methods endorsed by the International Commission for Uniform Methods of Sugar Analysis—of which Commission Dr. Browne is a member—receive full consideration throughout. The text is illustrated by a number of well-chosen and well-executed cuts, and the general excellence of the typography and make-up of the book reflect great credit on the publishers.

Dr. Browne is certainly entitled to the most cordial appreciation and congratulations of his fellow-workers on this classic contribution to their store of knowledge.

F. G. WIECHMANN

*Popular Guide to Minerals.* By L. A. GRATA-CAP. New York, D. Van Nostrand Company. 1912. 330 pages, 74 plates and 400 figures. Price \$3.00.

This book, as its name indicates, is intended chiefly for the general reader and student. It is designed largely to assist in the study and appreciation of the mineral collections to be found in our great museums. It is to be regretted that popular interest in minerals is by no means as widespread or as active to-day as it was twenty-five years ago and it is to be hoped, therefore, that this book may help to revive the study of minerals and to restore it to its proper place as one of the more interesting and popular branches of natural science.

The book contains a section on crystallography, followed by a discussion of the physical and chemical properties of minerals. The section devoted to the description of mineral species—in harmony with the purpose of the book—has been entitled, "Guide to Collections." An extensive history of the development of mineralogy follows and the book closes with a description of the fine Bement mineral collection which belongs to the American Museum of Natural History in New York City and of which the author of the book is curator.

The illustrations comprise first a series of more than seventy plates giving photographic reproductions of some of the finer and more striking specimens in the Bement collection. Mineral specimens offer many obstacles to successful reproduction in this way and nothing but praise can be said of the results achieved. It is to be regretted that the line figures used in the book, especially in its earlier sections, have not been reproduced as successfully.

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#### SPECIAL ARTICLES

##### ANTAGONISTIC ACTION OF ELECTROLYTES AND PERMEABILITY OF THE CELL MEMBRANE

1. The writer observed years ago that the newly fertilized eggs of *Fundulus* die in a  $5/8$  *m* NaCl solution without forming an embryo, while the addition of a very small but definite amount of a salt with a bivalent metal (with